

I claim:

1. A method of applying watermarks $WM_1...WM_k...WM_N$ to sections of $1...k...N$ of digital content on a recording medium having an identification number (CDID) comprising combining numerical values representing CDID, N and k in accordance with a concatenated hashing function to derive a numerical value for WM_i , and applying the numerical value for WM_i to section i , where i is selectively each of $1...N$.
2. A method of checking the watermark of section j of read digital content having watermarks applied in accordance with the method of claim 1 comprising determining the numerical values of CDID, j and N from the read digital content, determining the watermark WM_{ja} actually read from section j , combining the determined numerical values of CDID, j and N by using the same hashing function that is used to derive WM_i to derive a digital signal for the watermark WM_{jr} that should be read from section j , and comparing the digital signal for the watermark WM_{jr} that should be read from section j with an indication of the numerical value for the watermark WM_{ja} actually read from section j .
3. The method of claim 2 wherein CDID is read directly from the medium and WM_{jr} that should be read from section j is derived from $H(CDID \diamond N \diamond j)$, where H is the hashing function and \diamond is the concatenation of numbers.
4. The method of claim 2 wherein the correctness of the recorded CDID is determined by performing a calculation on value WM_{ja} actually read from section j .
5. The method of claim 4 wherein $H(CDID)$ is determined by subtracting $H(N_j)$ from the value of WM_{ja} actually read from section j .

6. The method of claim 5 wherein the value that should be read from section j is calculated in accordance with $H(N \hat{\Delta} j)$ to derive a first hashed function, and combining the first hashed function with the determined value of an invertible 2 argument operation that is hashed by hashing function H .
7. The method of claim 6 wherein the invertible 2 argument operation is an exclusive or function.
8. The method of claim 6 wherein the invertible 2 argument operation is a modular addition function.
9. A recording medium assigned with a numerical ID number (CDID), the medium including digital content, at least some of the digital content having watermarked sections $1 \dots i \dots N$, the watermark in section i having a numerical value in accordance with a hashed concatenated function of CDID, N and i .
10. The apparatus of claim 9 wherein the digital content includes media content.
11. Apparatus for applying watermarks $WM_1 \dots WM_k \dots WM_N$ to sections $1 \dots k \dots N$ of a recording medium adapted to have an identification number (CDID) and to include digital content in at least sections $1 \dots k \dots N$, the apparatus comprising a processor arrangement for combining for each of $1 \dots k \dots N$ digital signals indicative of CDID, k and N , the signals indicative of CDID, k and N being combined in accordance with a concatenated hashing function to derive a hashed concatenated output signal and a write unit for applying the hashed concatenated output signal to the recording medium.
12. Apparatus for checking the validity of digital watermarks in sections $1 \dots k \dots N$, of a digital recording medium having an identification number (CDID) and digital content

recorded in at least sections $1...j...N$ of the medium, the apparatus comprising a read unit for reading the digital content and the watermarks and for deriving digital signals indicative thereof, a processor arrangement connected to be responsive to the read unit for determining (a) the numerical value of bits WM_{jr} in watermarks that should be recorded in at least some of sections $1...j...N$ in accordance with a hashed function of concatenated values of a determined value of CDID combined with H , j and N , (b) the numerical values of bits WM_{ja} actually read from the medium, and (c) the relative values of WM_{jr} and WM_{ja} .

13. The apparatus of claim 11 wherein the processor arrangement is arranged to respond to CDID as read from the medium and for determining WM_{jr} and $H(CDID \diamond N \diamond j)$, where H is the hashing function and \diamond is the concatenation of numbers.

14. The apparatus of claim 12 wherein the processor arrangement is arranged for calculating the value of CDID in response to the value WM_{ja} actually read from section j .

15. The apparatus of claim 14 wherein the processor arrangement is arranged to respond to CDID as read from the medium and for determining WM_{jr} as actually read from section j .

16. The apparatus of claim 15 wherein the processor arrangement is arranged to determine CDID by subtracting of $H(N \diamond k)$ from the value of WM_{ja} actually read from section j .

17. The apparatus of claim 16 wherein the processor arrangement is arranged to (a) calculate the value that should be read from section j in accordance with $H(N \diamond j)$ to derive

a first hashed function and (b) combine the first hashed function with the determined value of an invertible 2 argument operation that is hashed by hashing function H.

18. The apparatus of claim 17 wherein the invertible 2 argument operation is an exclusive or function.

19. The method of claim 1 wherein the number of bits in the numerical value of WM_k is in the range of 20 to 24.

20. The method of claim 2 wherein the number of bits in the numerical value of WM_k is in the range of 20 to 24.

21. The medium of claim 9 wherein the numerical value is represented by 20 to 24 bits.

22. The method of claim 11 wherein the number of bits in the numerical value of WM_k is in the range of 20 to 24.

23. The apparatus of claim 12 wherein the number of bits in the numerical value of WM_k is in the range of 20 to 24.